REMARKS

Upon entry of this amendment, claims 1 and 4-21 are pending in the application, of which claims 1 and 4-21 are being amended.

Claims 1, 6, 11 and 17 are being amended to recite a detachable electrostatic chuck comprising an electrostatic puck and a base plate bonded to the electrostatic puck by a bond layer. These claim amendments are supported by the Specification at least at page 10, line 6 which recites "detachable electrostatic chuck 20" and by page 11, lines 13-14 which state "...the base plate 42 can be attached to the ceramic body 26 of the electrostatic puck 22 by a bond layer 54."

Claims 1 and 4-17 are also being amended to cosmetically improve the claims and to refer to proper antecedent from the parent claim.

The claim amendments are fully supported by the Specification and add no new matter. Accordingly, entry of the claim amendments is respectfully requested.

Double Patenting

Claims 1, 6, 8-10, 13-14, 11-12, 20-21, and 17 were provisionally rejected on the grounds of nonstatutory obviousness type double patenting as being unpatentable over claims 15, 19-21, and 23 of copending Application No. 11/221,169.

Upon allowance of the present application or Application No. 11/221,169, applicant will file a Terminal Disclaimer to overcome this rejection.

Claim Rejections Under 35 U.S.C. § 102(b)

I. Claims 1 and 4-5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Wang et al. (U.S. Patent No. 6,538,872).

In order to anticipate a reference, each and every element of the claim must be disclosed by a single prior art reference. W. L. Gore & Assocs. v. Garlock, Inc., (Fed Cir. 1983), cert. denied, 469 U.S. 851 (1984).

Wang et al. does not anticipate claim 1, or claims 4-5 which depend on claim1, because Wang et al. does not disclose each and every element of claim 1. Specifically, Wang et al. does not teach a detachable electrostatic chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and wherein the base plate comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal, as claimed in claim 1.

The Office Action's suggests that Wang et al. discloses:

> "...a base plate 175, 190 below the electrostatic puck, the base plate having an annular flange extending beyond the periphery of the ceramic body (flange of 175, 190 extending beyond 100 and Figure 1), the annular flange comprising a plurality of holes 315 (see Figure 6) to allow connectors 320 (see Figure 6) to pass through, and wherein the base plate comprises a composite of a porous ceramic infiltrated with metal (see Abstract, column 5, lines 32-33, column 7, lines 10-24)."

However, Applicant respectfully disagrees the Office Action's reading of Wang et al. First, Wang et al. does not teach a detachable electrostatic chuck comprising an electrostatic puck comprising and a base plate bonded to the electrostatic puck by a bond layer, which is detachable from the chamber or other

components of the process chamber. As disclosed by Wang et al, the "base 175" is bonded to the "support 190" as shown in Figure 6. Wang teaches:

> In another version, the support 190 is bonded to the base 175 of the electrostatic chuck 55 by a second bond layer 295 of compliant and ductile material that is provided to further absorb the thermal stresses that occur from differences in thermal expansion of the support 190 and the base 175.

(Wang et al. Col. 11,lines 9-13.) By teaching that the support 190 is bonded to the base 175 of the electrostatic chuck by the bond layer 295, Wang et al. does not teach a detachable electrostatic chuck which is detachable from the components of the chamber, or the chamber itself, as claimed in claim 1.

Secondly, the base 175 taught by Wang et al. does not teach the claim language to a "base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough...", as claimed in claim 1. It can be seen from Figure 6 that the base 175 does not have an annular flange that extends beyond the periphery of the ceramic body of the electrostatic puck 100. Instead, the base 175 extends all the way to the perimeter of the electrostatic puck 100. Thus, Wang et al. does not teach a base plate having an annular flange extending beyond the periphery of the ceramic body, as claimed.

Third, Wang et al. does not teach a base plate having an annular flange comprising a plurality of holes to allow connectors to pass therethrough, as claimed in claim 1. The base 175 taught by Wang et al. does not have holes for connectors. As claimed, the detachable electrostatic chuck is detachable from the process chamber because the base plate has a plurality of holes to allow connectors to pass therethrough and hold the detachable assembly to the chamber. Thus the claimed connector holes allow attachment, and detachment, of the detachable electrostatic chuck from the chamber. Wang et al. does not teach a base plate having an annular flange comprising a plurality of holes to allow connectors to pass therethrough, as claimed in claim 1.

Applicant also disagrees with Office Action's remarks that the support 190 with the threaded inserts 315, as taught by Wang et al., meets the claimed language to a detachable electrostatic chuck comprising an electrostatic puck bonded to a base plate with a bond layer, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, as claimed in claim 1.

First, Wang et al. discloses that the support 190 has threaded inserts 315, as shown in Figure 6, to allow bolts 320 to secure the entire assembly of the electrostatic chuck 55 (an electrostatic puck 100 bonded to a base 175) bonded to the support 190 by the bond layer 295, to the chamber. Wang et al. discloses:

> "... the support 190 can comprise threaded inserts 315 ... into which bolts 320 are threaded to secure support 190 (with the electrostatic chuck 55 bonded thereto) to the chamber 15."

(Wang et al., Column 12, lines 5 – 9). Thus Wang et al. teaches that the support 190 is bonded to the base 175 of the electrostatic chuck by the bond layer 295, and that this entire assembly is bolted onto the chamber. Wang et al. also teaches elsewhere in the Specification that "[t]he base 175 and the support 190 secure the electrostatic chuck 55 to the chamber 25 ...". (Wang et al., Column 5, lines 8- 9). Thus Wang et al. teaches an electrostatic chuck 55 which is bonded to a support 190 by the bond layer 295, and which, consequently, is not detachable from the support 190. Thus Wang et al. does not teach a detachable electrostatic chuck comprising an electrostatic puck bonded to a base plate with a bond layer, which is detachable from the chamber, as claimed in claim 1.

As a further distinction, Wang et al. does not teach a detachable electrostatic chuck comprising a base plate having an annular flange comprising a plurality of holes to allow connectors to pass therethrough, as claimed in claim 1. The threaded inserts 315 in the base 190 of Wang et al. do not allow connectors to pass therethrough. Instead, Wang et al. teaches that the threaded inserts 315 extend only partially through the structure of the support 190 and terminate within the support 190,

as shown in Figure 6. Thus, Wang et al. does not teach a base plate having annular flange comprising a plurality of holes to allow connectors to pass therethrough, as claimed in claim 1.

Further, the threaded inserts 315 in base 190 of Wang et al., as shown in Figure 6, do not extend through an annular flange of the base plate, as claimed. Instead, the threaded inserts 315 extend through the body of the base 190. The claimed holes extend through an annular flange of the base plate which extends beyond the periphery of the ceramic body of the electrostatic puck. In contrast, the threaded inserts 315 of Wang et al. occur inward of the periphery of the ceramic body of an electrostatic puck, as shown in Figure 6, and thus are not holes which extend through an annular flange extending beyond the periphery of the ceramic body of the electrostatic chuck, as claimed.

For these reasons, Wang et al. does not teach all of the elements of claim 1 and therefore does not anticipate claim 1, nor claims 4 – 5 which depend therefrom.

Claim Rejections Under 35 U.S.C. § 103(a)

I. Claims 6-10, 14-16 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Weldon (U.S. Patent No. 6,108,189) in view of Wang et al. (U.S. Patent No. 6,538,872).

Applicant respectfully traverses this rejection.

An obviousness rejection requires that the prior art references, when combined, teach or suggest the invention as a whole. In making the assessment of differences between the prior art and the claimed subject matter, section 103 specifically requires consideration of the claimed invention "as a whole." Princeton Biochemicals, Inc. v. Beckman Coulter, Inc. (Fed. Cir., No. 04-1493, 6/9/05). To establish obviousness, all the claim limitations must be taught or suggested by the prior

art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F. 2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

Independent claims 6, 11, and 17 and the claims dependent therefrom, are patentable under 35 U.S.C. 103(a) over Weldon et al. in view of Wang et al., because the cited combination does not teach a detachable electrostatic chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and wherein the base plate comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal, as claimed in any of claims 6, 11 and 17.

First, Weldon et al. does not teach a detachable electrostatic chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer, as claimed in the cited claims. Instead, Weldon et al. teaches various electrical isolator structures from column 8, line 26 to column 19, line 49; and further teaches various semiconducting dielectric members from column 19, line 50 to column 27, line 46. Weldon et al. does not teach or suggest a detachable electrostatic chuck.

Nor does Weldon et al. teach or suggest a detachable chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer. Instead, Weldon et al. teaches an electrostatic chuck structure comprising a ceramic with pores that are filled

with a polymer are directed to the electrostatic member comprising the electrode. With regard to the base plate 105 below this electrostatic chuck member, Weldon et al. teaches that the base plate is made entirely from a metal. Oh

Second, the Office Action acknowledges that "Weldon does not disclose the an annular flange extending beyond the annular periphery of the ceramic body, the plurality of holes are on the flange and are shaped and sized to allow connectors to pass therethrough, and that the base plate comprises a composite ceramic material comprising pores that are at least partially infiltrated with a metal."

Furthermore, the Office Action states that Weldon et al. teaches "a support pedestal (see structure below 105 in Figure 2) having a housing and an annular ledge, the annular ledge extending outwardly from the housing, wherein the annular ledge is capable of being attached to the annular flange of the base plate by the connectors (column 12, lines 37-60). The Weldon et al. section cited by the Office Action, namely, column 12, lines 37-60, does not refer to Figure 2, and instead teaches that "Fig. 7 shows an embodiment of the electrical isolator comprising a tubular sleeve 320 shaped as a right circular cylinder with an axial opening 328 therethrough..." This section further teaches "[p]referably, a plurality of such tubular sleeves 320 are positioned around the electrode 110." Thus, the cited section of Weldon et al. does no teach "a support pedestal having a housing and an annular ledge, and also does not teach an annular ledge extending outwardly from the housing, wherein the annular ledge is capable of being attached to the annular flange of the base plate by the connectors, as suggested by the Office Action.

In addition, as shown in Fig. 2, Weldon et al. teaches a base plate 105 which is made of metal, and which has no annular flange extending beyond the circumference of structure of the dielectric member 115 and electrode 110 which rests on the base plate 105. In another version, shown in Fig. 4b, Weldon et al. teaches a base plate 105 having an annular flange made of metal and not a composite material,

and which also does not have a plurality of holes to allow connectors to pass therethrough.

Thus, Weldon et al. does not teach any of claims 6, 11 and 17.as a whole, because Weldon et al. does not teach a detachable electrostatic chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and wherein the base plate comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal, as claimed.

The Office Action further states that: "Wang, and not Weldon, is relied upon for the teachings of the base plate that comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal".

However, neither Wang et al. nor Weldon et al. teach a detachable electrostatic chuck comprising a base plate having an annular flange having a plurality of holes to allow connectors to pass therethrough, as recited in claims 1 and 17; or having an annular flange having a plurality of holes that are shaped and sized to allow connectors to pass therethrough, as recited in claims 6 and 11.

Wang et al. does not cure the deficiencies of Weldon et al. because Wang et al. also does not teach an electrostatic chuck comprising a base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and in which the annular flange comprises a plurality of holes to allow connectors to pass therethrough. As seen from Figs. 1, 2, 4a, 5, 6, and 7a-7c of Wang et al., Wang et al. does not teach a base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and which comprises a plurality of holes to allow connectors to pass therethrough. Instead, Wang et al. teaches a base plate 175, which does not have an annular flange with a plurality of holes to allow connectors to pass therethrough.

Further, Wang et al. also does not teach a baseplate having a flange under the definition of the word. One definition of flange is "a protruding rim, edge, rib, or collar, as on a wheel or a pipe shaft, used to strengthen an object, hold it in place, or attach it to another object." American Heritage® Dictionary of the English Language, Fourth Edition. The composite baseplate having an annular flange, as claimed, is not taught by Wang et al. because Wang et al. does not teach a baseplate having a protruding rim, edge, rib, or collar, used to strengthen the baseplate, hold it in place, or attach it to another object, i.e. a flange.

In addition, Wang et al. does not teach a composite base plate with an annular flange that extends beyond the periphery of an overlying ceramic body, and which comprises a plurality of holes to allow connectors to pass therethrough. Instead, Wang et al. teaches a base plate 175 without connector holes extending through an annular flange of the base plate. Thus Wang et al. teaches away from a base plate made from a composite material and which has an annular flange with a plurality of holes that allow connectors to pass therethrough.

Furthermore, forming connector holes that extend through the entire thickness of a composite ceramic structure can be a difficult task when the composite material comprises a brittle ceramic material that can fracture during machining of such through holes. It much easier to form holes in a solid metal base of the type taught by Weldon et al. or the partial holes taught by Wang et al. Consequently, one of ordinary skill in the art would have no motivation to form a plurality of connector holes that extend through a composite baseplate, based on the combined teachings of Wang et al. and Weldon et al..

In addition to the reasons provided above, Weldon et al. and Wang et al. in combination, do not render the present claims obvious, because neither reference teaches us suggests the advantages and benefits, and consequently, the reasons for adopting the claimed detachable electrostatic chuck. As explained in the specification

the detachable electrostatic chuck provides significant benefits over prior art structures which are also not taught or suggested by the cited references:

> The electrostatic chuck 20 having the base plate 42 comprising the composite material and having the annular flange 46 is an improvement over conventional substrate supports because the electrostatic chuck 20 allows for the electrostatic puck 22 and base plate 42 to be easily removed from the pedestal 32 when replacement or refurbishment of one or more of the electrostatic puck 22 and base plate 42 is required. Because the exposed annular flange portion of the base plate 42 is not covered by the relatively brittle ceramic body 26, the relatively strong composite material of the annular flange 46 can be detachably directly connected to the pedestal 32 to allow for easy removal of the puck 22 and base plate 42. For example, the electrostatic puck 22 and base plate 20 can be detachably connected to the pedestal 32 by inserting the connector 44 through the composite material of the flange 46 and into the pedestal 32. The puck 22 and base plate 42 can then be removed from the pedestal 32 by removing the connector 44 from at least one of the base plate flange 46 and pedestal ledge 40, when one or more of the puck 22 and base plate 42 has become excessively eroded or dirtied with process residues.
>
> The detachable electrostatic chuck 20 reduces the costs associated with processing substrates with the chuck 20 by allowing the electrostatic puck 22 and/or base plate 42 to be replaced or refurbished as needed, without requiring replacement of the entire chuck 20. The base plate 42 having the annular flange 46 provides significant advantages in allowing the electrostatic chuck 20 to be directly attached to, while still easily removable from, the chamber 106. The base plate 42 and annular flange 46 can also be made from a material that is more ductile than the ceramic material of the electrostatic puck 22, to reduce the effect of thermal expansion mismatches between the chuck 20 and the underlying pedestal 32. Also, because the annular flange 46 extends outwardly from the base plate 42, an operator can more easily see and access the bolts positioned on the annular flange 46, allowing the operator to more easily remove the chuck 20 from the chamber 106 when it requires cleaning, servicing, or refurbishment. In the prior art, the chuck 20 was joined to the pedestal 32 by a bond or metal braze so that the entire assembly including the pedestal 32 had to be removed from the chamber 106. Also, it was more difficult to reach down to the bottom of the chamber to access the underlying attachment components to remove the entire assembly. Removal of the entire prior art assembly from the chamber 106 can also result in possibly increased contamination of the larger surface or volume of components outside the chamber 106. In contrast, the present chuck 20 provides easier removal access, reduced thermal expansion mismatch stresses, and a smaller volume of components to remove from the chamber 106.

(Specification, page 9 , line 24 – page 10, line 27). These benefits and advantages are not taught by the cited references.

For these reasons, the combination of Weldon et al. in view of Wang et al. does not render obvious the detachable electrostatic chuck assembly claimed in any one of claims 6, 11, and 17, or the claims depend therefrom.

II. Claims 11-12 and 20-21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Weldon in view of Wang et al. and Cole et al. (U.S. Patent No. 6,700,099).

Claims 12, 20 and 21 are dependent upon claim 11. As explained above, claim 11 is not obvious over the combination of Weldon et al. in view of Wang et al. because the cited combination does not teach a detachable electrostatic chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and wherein the base plate comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal, as claimed in claim 11.

Cole et al. further does not cure the deficiencies of Weldon et al. in view of Wang et al., because Cole et al. also does not teach a detachable electrostatic chuck. Instead, Cole et al. is cited for teaching a workpiece chuck that includes a thermal plate assembly comprising a cooling tube for circulating a cooling fluid. Nor does Cole et al. teach an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer. Cole et al. also does not teach a chuck comprising a base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and wherein the base plate comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal, as claimed in claim 11.

For these reasons, the combination of Weldon et al. in view of Wang et al. and Cole et al. do not render obvious, claim 11 or the claims dependent therefrom.

III. Claims 13 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Weldon in view of Wang et al. and Flanigan et al. (U.S. Patent No. 6,061,414).

Claim 13 is dependent upon claim 11 and claim 17 is an independent claim. As explained above, claims 11 and 17 are not obvious over the combination of Weldon et al. in view of Wang et al. because the cited combination does not teach a detachable electrostatic chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer, the base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and wherein the base plate comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal, as claimed in claims 11 and 17.

Flanigan et al. also fails to make up for the deficiencies of Weldon et al. and Wang et al. because Flanigan et al. also does not teach or suggest a detachable electrostatic chuck comprising an electrostatic puck comprising a ceramic body with an embedded electrode, and a base plate bonded to the electrostatic puck by a bond layer. Instead, Flanigan et al. teaches an electrode or cooling plate between the electrostatic chuck and the pedestal, where the electrode or cooling plate is fabricated from a metal:

> An electrode 234 is disposed between the electrostatic chuck 105 and the pedestal 104. Specifically, the electrode 234 is disposed directly below the electrostatic chuck 105 inside the enclosure 208. Preferably, the electrode 234 is fabricated from a material that is a high conductor of RF power. In a preferred embodiment of the invention, the electrode has the form of a cooling plate 234 fabricated of a block of copper or stainless steel that is machined to a high degree of precision so that it fits and communicates with other enclosure components as described below.... the cooling plate 234 may be plated to prevent oxidation of the cooling plate material. Preferably, the plating material is nickel. (Flanigan et al., Col. 6, lines 10-30.)

Thus, Flanigan et al. teaches a underlying cooling plate below the electrostatic chuck (or puck) that is a solid metal and not a composite comprising a ceramic material with pores at least partially filed with a metal. Further, Flanigan et al. does not teach or suggest a structure comprising a base plate composed of a ceramic material comprising pores at least partially filed with metal, as recited in amended claims 11 and 17. Flanigan et al. also does not teach a detachable e-chuck comprising a base plate having an annular flange extending beyond the periphery of the ceramic body, the annular flange comprising a plurality of holes to allow connectors to pass therethrough, and wherein the base plate comprises a composite of a ceramic material comprising pores that are at least partially filled by a metal, as claimed in claims 11 and 17.

Thus the combination of Weldon et al., Wang et al. and Flanigan et al. does not render obvious claims 11 or 17, or claim 13 which depends on claim 11.

Should the Examiner have any questions regarding the above remarks, the Examiner is requested to telephone Applicant's representative at the number listed below.

Respectfully submitted,
JANAH & ASSOCIATES, P.C.

Date: August 25, 2008

By: _____
Ashok Janah
Reg. No. 37,487

Please direct all telephone calls to Ashok K. Janah at (415) 538-1555

Please continue to send correspondence to:
Janah & Associates, P.C.
650 Delancey Street, Suite 106
San Francisco, California 94107